

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No
PCT/JP2004/003584

International filing date (day/month/year)
17.03.2004

Priority date (day/month/year)
18.03.2003

International Patent Classification (IPC) or both national classification and IPC
G02F1/167, G02F1/1339

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66 1bis(b) that written opinions of this International Searching Authority will not be so considered

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later

For further options, see Form PCT/ISA/220

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/003584

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/003584

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-6
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-6
Industrial applicability (IA)	Yes: Claims	1-6
	No: Claims	

2. Citations and explanations

see separate sheet

Regarding Item V.

1 The following documents are referred to in this communication:

D1 : US 2003/048521 A1

D2: US-A-4 305 807

2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-6 is not inventive in the sense of Article 33(3) PCT, the reasons being as follows.

2.1 Document D1 discloses, in figure 1 and paragraphs 63-70 and 77 (the references in parenthesis applying to this document), an electrophoretic display device with

- a display substrate 1 and a rear substrate 2 disposed with a space;
- a transparent liquid 4 including a plurality of charged particles 5 and disposed between the substrates;
- a partition wall 3 disposed in between the substrates;
- a light shielding layer 7 ("second electrode ... includ[es] metals such as titanium ..."); and
- a light scattering layer 6 ("first electrode ... is roughened so as to irregularly reflect light, or a light scattering layer is formed on the electrode") disposed on the rear substrate for reflecting light.

The partition wall is formed of the same material as the substrates or may be a photosensitive resin, such as acrylic resin (paragraph 65). The substrate material may comprise (paragraph 67) PET ($n \sim 1.6$), PC ($n \sim 1.6$), PES ($n \sim 1.65$). The transparent liquid (paragraph 69) may consist of xylene ($n \sim 1.497$) or toluene ($n \sim 1.495$).

2.2 In order to build a display device, a skilled person would select from the materials mentioned in the description of D1 without exercising any inventive skills. He would therefore arrive at a device wherein the refractive index of the partition wall is not less than that of the transparent liquid. Moreover, given the refractive indices $n_{\text{wall}} = 1.6$ (PET, PC) and $n_{\text{liquid}} = 1.497$ (xylene), light incident on the display at an incident angle of about 35° or more that enters the partition wall is not totally reflected but refracted into the transparent liquid at the side face of the wall. For $n_{\text{wall}} = 1.54$ (quartz) and $n_{\text{liquid}} = 1.497$ (xylene), even light incident at an angle of 22° or more would be refracted. Using epoxy resin ($n \sim 1.55$) the condition given in claim 2 would also be fulfilled. Since the width and height of the

**WRITTEN OPINION OF THE
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AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP2004/003584

partitioning wall (paragraph 77) is 10 μm and 20 μm , respectively, the angle α of claim 3 is about 26°. The condition given in claim 3 is thus also fulfilled.

- 2.3 The subject-matter of claims 1 to 5 cannot therefore be considered inventive.
- 2.4 Since document D2 teaches that an electrophoretic display device can be improved by using a liquid crystal as the transparent liquid, the subject-matter of claim 6 is also not considered inventive.